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STEDMAN'S

Medical Dictionary

26th Edition

ILLUSTRATED IN **COLOR**



Williams & Wilkins

Baltimore • Philadelphia • Hong Kong
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ANTIGEN

an-ti-gen (Ag) (an'ti-jen). Any substance that, as a result of coming in contact with appropriate cells, induces a state of sensitivity and/or immune responsiveness after a latent period (days to weeks) and which reacts in a demonstrable way with antibodies and/or immune cells of the sensitized subject *in vivo* or *in vitro*. Modern usage tends to retain the broad meaning of a., employing the terms "antigenic determinant" or "determinant group" for the particular chemical group of a molecule that confers antigenic specificity. SEE ALSO hapten. SYN immunogen. [anti(body) + G. -gen, producing]

ABO a.'s, see ABO blood group, Blood Groups appendix.

acetone-insoluble a., SYN cardiolipin.

allogeneic a. (al'ō-jē-ne'ik), genetic variations of the same a.'s within a given species.

Am a.'s, allotypic determinants (antigens) on human immunoglobulin alpha heavy chains.

Au a., (1) see Auberger blood group, Blood Groups appendix; (2) SYN Australia a.

Aus a., SYN Australia a.

Australia a., so-called because it was first recognized in an Australian aborigine, but now known to be an a. associated with hepatitis B virus surface antigen. SYN Au a. (2), Aus a.

Be^a a.'s, see low frequency blood groups, Blood Groups appendix. SYN Becker a.

Becker a., SYN Be^a a.'s.

Bi a., see low frequency blood groups, Blood Groups appendix. SYN Bile's a.

Bile's a., SYN Bi a.

blood group a., generic term for any inherited antigen found on the surface of erythrocytes that determines a blood grouping reaction with specific antiserum; a.'s of the ABO and Lewis blood groups may be found also in saliva and other body fluids; the genes controlling development of blood group a.'s vary in frequency in different population and ethnic groups. See also Blood Groups appendix. SYN blood group substance.

By a., see low frequency blood groups, Blood Groups appendix.

capsular a., that found only in the capsules of certain microorganisms; e.g., the specific polysaccharides of various types of pneumococci.

carcinoembryonic a. (CEA), a glycoprotein constituent of the glycocalyx of embryonic endodermal epithelium, generally absent from adult cells with the exception of some carcinomas. It may also be detected in the serum of patients with colon cancer.

C carbohydrate a., an antigen found in the cell wall of *Streptococcus pneumoniae*. SEE β -hemolytic streptococci, under streptococcus.

CDE a.'s, see Rh blood group, Blood Groups appendix.

cholesterinized a., cardiolipin to which cholesterol has been added.

Chr^a a.'s, see low frequency blood groups, Blood Groups appendix.

class I a.'s, cell membrane bound glycoproteins that are coded by genes of the major histocompatibility complex.

class II a.'s, a cell membrane glycoprotein encoded by genes of the major histocompatibility complex. These antigens are distributed on a-presenting cells such as macrophages, B cells, and dendritic cells.

class III a.'s, non-cell membrane molecules that are encoded by the S region of the major histocompatibility complex. These a.'s are not involved in determining histocompatibility and include the complement proteins.

common a., cross reacting antigen (epitope), a common antigen that occurs in 2 or more different molecules/organisms. SYN heterogenic enterobacterial a.

complete a., any a. capable of stimulating the formation of antibody with which it reacts *in vivo* or *in vitro*, as distinguished from incomplete a. (hapten).

conjugated a., SYN conjugated hapten.

D a., one of 6 antigens that compose the Rh locus. Antibody induced by D antigen is the most frequent cause of hemolytic disease of the newborn.

delta a., SYN hepatitis delta virus.

Dharmendra a., a chloroform-ether extracted suspension of *Mycobacterium leprae*; used to produce the Fernandez reaction in a lepromin test.

Di a., see Diego blood group, Blood Groups appendix.

Duffy a.'s, see Duffy blood group, Blood Groups appendix.

flagellar a., the heat-labile a.'s associated with bacterial flagella, in contrast to somatic a. SEE ALSO H a.

Forssman a., a type of heterogenetic a. found in dogs, horses, sheep, cats, turtles, eggs of some fish, in certain bacteria (e.g., some strains of enteric organisms and pneumococci), and varieties of corn; usually found in the tissues and organs (not in blood), but is present in sheep erythrocytes, though not in this animal's tissues; with the exception of guinea pigs and hamsters, Forssman a. is not found in rodents, or in frogs, hogs, and most primates; the antibody that develops in infectious mononucleosis of man reacts specifically with the Forssman a.

Fy a.'s, see Duffy blood group, Blood Groups appendix.

G a., an antigenic glycoprotein frequently associated with viral surfaces. [Ger. *gebundenes*, bound]

Ge a., see high frequency blood groups, Blood Groups appendix.

Gerbich a., glycophorin C. SEE glycophorins.

Gm a.'s, allotypic determinants (antigens) that are present on the heavy chain of immunoglobulin G. There are 25 different determinants present throughout the human population.

Good a., see low frequency blood groups, Blood Groups appendix.

Gr a., SYN Vw a. See Vw a. under MNSs blood group in Blood Groups Appendix.

group a.'s, a.'s that are shared by related genera of microorganisms.

H a., (1) the a. in the flagella of motile bacteria; so named because first identified in motile bacteria from a film (Ger. *Hauch*) of spreading growth on agar medium; SEE ALSO O a. (1). (2) the chemical precursor of a.'s of the ABO blood group locus.

H-2 a.'s, a.'s that are coded by the H-2 complex of genes in mice and are involved in self/nonself recognition.

He a.'s, see MNSs blood group, Blood Groups appendix. SYN Hu a.'s.

heart a., SYN cardiolipin.

hepatitis-associated a. (HAA), a term used for the surface a. of hepatitis B virus before its nature was established. SEE hepatitis B surface a.

hepatitis B core a. (HB_eAb, HB_eAg), the a. found in the core of the Dane particle (which is the complete virus) and also in hepatocyte nuclei in hepatitis B infections.

hepatitis B e a. (HB_eAb, HBe, HB_eAg), an a., or group of a.'s, associated with hepatitis B infection and distinct from the surface a. (HB_sAg) and the core a. (HB_eAg); it is associated with the viral nucleocapsid. Its presence indicates that the virus is replicating and the individual is potentially infectious.

hepatitis B surface a. (HB_sAb, HB_sAg), a. of the small (20 nm) spherical and filamentous forms of hepatitis B a., and a surface a. of the larger (42 nm) Dane particle (complete infectious hepatitis B virus). SEE ALSO hepatitis B core a., hepatitis B e a.

heterogeneic a., SEE heterophile a.

heterogenetic a., an a. which is possessed by a variety of different phylogenetically unrelated species; e.g., the various organ- or tissue-specific a.'s, the alpha- and beta-crystalline protein of the lens of the eye, and Forssman a. SYN heterophil a.

heterogenic enterobacterial a., SYN common a.

heterophil a., SYN heterogenetic a.

heterophile a., an a. or antigenic determinant which is found in different tissues in more than one species.

hexon a., SEE hexon.

histocompatibility a., an a. on the surface of nucleated cells, particularly leucocytes and thrombocytes. SEE ALSO H-2 a.'s. SYN transplantation a.

an

used to determine sensitiveness to the plant or to relieve the dermatitis caused by contact with its leaves.

S a., SYN soluble a.

sensitized a., the complex formed when a. combines with specific antibody; so called because the a., by the mediation of antibody, is rendered sensitive to the action of complement.

shock a., an a. capable of producing anaphylactic shock in an animal that has been sensitized to it.

Sm a., see high frequency blood groups, Blood Groups appendix.

soluble a., viral a. that remains in solution after the particles of virus have been removed by means of centrifugation; in the case of the influenza viruses, it is the internal helical structure, free of the external envelope. SYN S a.

somatic a., an a. located in the cell wall of a bacterium in contrast to one in the flagella (flagellar a.) or in a capsule (capsular a.).

species-specific a., antigenic components in the tissues and fluids of members of a species of animal, by means of which various species may be immunologically distinguished; e.g., serum albumin of horses is immunologically different from that of man, dogs, sheep, and so on.

specific a.'s, a.'s that characterize a single genus of microorganisms.

Stobo a., see low frequency blood groups, Blood Groups appendix.

Streptococcus M a., the somatic a. associated with virulence and type specificity of group A streptococci. SYN M protein (1).

Sw^a a., see low frequency blood groups, Blood Groups appendix.

Swann a.'s, see low frequency blood groups, Blood Groups appendix.

T a.'s, tumor antigens associated with replication and transformation by certain DNA tumor viruses, including adenoviruses and papovaviruses. SEE ALSO β -hemolytic streptococci, under streptococcus, tumor a.'s.

Tac a., an antigenic determinant of the human interleukin 2 receptor that is identified by a murine monoclonal antibody, anti-Tac. Binding of this antigen prevents the proliferation of T cells, which is normally stimulated by binding interleukin-2.

T-dependent a., an a. that requires T helper cells in addition to appropriate B cells. Most a.'s are T-dependent.

theta a. (thā'tā), a surface glycoprotein that is present on thymocytes of mice and rats.

thymus-independent a., an a. that does not require T helper cell activation in order for the host's B cells to be stimulated. Repeating polymers such as polysaccharides are examples of T-independent a.'s.

tissue-specific a., SYN organ-specific a.

Tj a., see P blood group, Blood Groups appendix.

Tr^a a., see low frequency blood groups, Blood Groups appendix.

transplantation a., SYN histocompatibility a.

tumor a.'s, (1) a.'s that may be frequently associated with tumors or may be specifically found on tumor cells of the same origin (tumor specific); (2) tumor antigens may also be associated with replication and transformation by certain DNA tumor viruses, including adenoviruses and papovaviruses. SYN neoantigens. SEE ALSO T a.'s.

tumor-associated a., a.'s that are highly correlated with certain tumor cells. They are not usually found, or are found to a lesser extent, on normal cells.

tumor-specific transplantation a.'s (TSTA), surface a.'s of DNA tumor virus-transformed cells, which elicit an immune rejection of the virus-free cells when transplanted into an animal that has been immunized against the specific cell-transforming virus.

V a., viral a. that is intimately associated with the virus particle, is protein in nature, has multiple antigenicities, and is strain-specific; antibody to such a. is demonstrable as protective or neutralizing antibody.

Vel a., see high frequency blood groups, Blood Groups appendix.

Ven a., see low frequency blood groups, Blood Groups appendix.

Vi a., "virulence a." an external capsular a. of enterobacteria formerly thought to be related to increased virulence.

Vw a., see MNSs blood group, Blood Groups appendix. SYN Gr a.

Webb a., see low frequency blood groups, Blood Groups appendix.

Wr^a a., see low frequency blood groups, Blood Groups appendix.

Wright a.'s (Wr^a), see low frequency blood groups, Blood Groups appendix.

Xg a., see Xg blood group, Blood Groups appendix.

Yt^a a., see high frequency blood groups, Blood Groups appendix.

an-ti-ge-ne-mia (an'ti-jē-nē-mē-ă). Persistence of antigen in circulating blood; e.g., HB_e-antigenemia (presence of hepatitis B virus surface antigen in blood serum). [antigen + G. *haima*, blood]

an-ti-gen-ic (an-ti-jen'ik). Having the properties of an antigen (allergen). SYN allergenic, immunogenic.

an-ti-ge-nic-i-ty (an'ti-jē-nis'i-tē). The state or property of being antigenic. SYN immunogenicity.

an-ti-gon-or-rhe-ic (an'tē-gon-ō-rē'ik). Curative of gonorrhea.

an-ti-grav-i-ty (an-tē-grav'i-tē). SEE anti-G.

an-ti-HB_c. Antibody to the hepatitis B core antigen (HB_cAg).

an-ti-HB_s. Antibody to the hepatitis B surface antigen (HB_sAg).

an-ti-HB e. Antibody to the hepatitis B e antigen (HB_eAg).

an-ti-he-li-x (an-tē-hē'liks). An elevated ridge of cartilage anterior and roughly parallel to the posterior portion of the helix of the external ear. SYN anthelix [NA].

an-ti-helminthic (an'tē-hel-minth'ik). SYN anthelmintic (1).

an-ti-hem-ag-glu-ti-nin (an'tē-hē-mā-glū'ti-nin, an'tē-hem-ă-). A substance (including antibody) that inhibits or prevents hemagglutination.

an-ti-he-mo-ly-sin (an'tē-hē-mol'i-sin, an'tē-hem-ol'-). A substance (including antibody) that inhibits or prevents the effects of hemolysin.

an-ti-he-mo-lyt-ic (an'tē-hē-mō-lit'ik, an'tē-hem-ō-). Preventing hemolysis.

an-ti-hem-or-rhag-ic (an'tē-hem-ō-rāj'ik). Arresting hemorrhage. SYN hemostatic (2).

an-ti-hi-drot-ic (an'tē-hi-drot'ik, -hi-drot'ik). SYN antiperspirant.

an-ti-his-ta-mines (an'tē-his-tā-mēnz). Drugs having an action antagonistic to that of histamine; used in the treatment of allergy symptoms.

an-ti-his-ta-min-ic (an'tē-his-tā-min'ik). 1. Tending to neutralize or antagonize the action of histamine or to inhibit its production in the body. 2. An agent having such an effect, used to relieve the symptoms of allergy.

an-ti-hor-mones (an'tē-hōr'mōnz). Substances demonstrable in serum that inhibit or prevent the usual effects of certain hormones, e.g., specific antibodies.

an-ti-hy-dri-ot-ic (an'tē-hi-drē-ot'ik). SYN antiperspirant.

an-ti-hy-drop-ic (an'tē-hi-drop'ik). 1. Relieving edema (dropsy). 2. An agent that mobilizes accumulated fluids.

an-ti-hy-per-ten-sive (an'tē-hi-per-ten'siv). Indicating a drug or mode of treatment that reduces the blood pressure of hypertensive individuals.

an-ti-hyp-not-ic (an'tē-hip-not'ik). 1. Preventing or tending to prevent sleep. 2. An arousing agent, or one antagonistic to sleep.

an-ti-hy-po-ten-sive (an'tē-hi-pō-ten'siv). Any measure or medication that tends to raise reduced blood pressure.

an-ti-ic-ter-ic (an'tē-ik-ter'ik). Rarely used term for preventing or curing icterus (jaundice).

an-ti-in-flam-ma-to-ry (an'tē-in-flam'ă-tō-rē). Reducing inflammation by acting on body mechanisms, without directly an-

an

ing and in delaying rejection of a tumor allograft; aside from antibody, nonspecific substances may also act to enhance immune response. *SYN* immunological enhancement.

im-mu-no-en-hanc-er (im'yū-nō-en-hans'er). Any specific or nonspecific substance that increases the degree of the immune response.

im-mu-no-fer-ri-tin (im'yū-nō-fer'i-tin). Antibody-ferritin conjugate used to identify specific antigen by electron microscopy.

im-mu-no-flu-o-res-cence (im'yū-nō-flūr-es'ens, i-myū'nō-). An immunohistochemical technique using labeling of antibodies by fluorescein, or rhodamine, isothiocyanates to identify bacterial, viral, or other antigenic material specific for the labeled antibody; the specific binding of antibody can be determined microscopically through the production of a characteristic visible light by the application of ultraviolet rays to the preparation. *SEE ALSO* fluorescent antibody technique.

im-mu-no-gen (i-myū'nō-jen). *SYN* antigen.

behavioral i., not smoking, regular exercise, and related health-enhancing personal habits and lifestyle of an individual which are associated with a decreased risk of physical illness and dysfunction, and with greater longevity.

im-mu-no-ge-net-ics (im'yū-nō-jē-net'iks). The study of the genetics of transplantation and tissue rejection, histochemical loci, immunologic response, immunoglobulin structure, and immunosuppression.

im-mu-no-gen-ic (im'yū-nō-jen'ik). *SYN* antigenic.

im-mu-no-ge-nic-i-ty (im'yū-nō-jē-nis'i-tē). *SYN* antigenicity.

im-mu-no-glob-u-lin (Ig) (im'yū-nō-glob'yū-lin) [MIM* 146880-146910]. One of a class of structurally related proteins, each consisting of two pairs of polypeptide chains, one pair of light (L) [low molecular weight] chains (κ or λ), and one pair of heavy (H) chains (γ , α , δ , and ϵ), all four linked together by disulfide bonds. On the basis of the structural and antigenic properties of the H chains, Ig's are classified (in order of relative amounts present in normal human serum) as IgG (7 S in size, 80%), IgA (10 to 15%), IgM (19 S, a pentamer of the basic unit, 5 to 10%), IgD (less than 0.1%), and IgE (less than 0.01%). All of these classes are homogeneous and susceptible to amino acid sequence analysis. Each class of H chain can associate with either κ or λ L chains. Subclasses of Ig's, based on differences in the H chains, are referred to as IgG1, etc.

When split by papain, IgG yields three pieces: the Fc piece, consisting of the C-terminal portion of the H chains, with no antibody activity but capable of fixing complement, and crystallizable; and two identical Fab pieces, carrying the antigen-binding sites and each consisting of an L chain bound to the remainder of an H chain.

Antibodies are Ig's, and all Ig's probably function as antibodies. However, Ig refers not only to the usual antibodies, but also to a great number of pathological proteins classified as myeloma proteins, which appear in multiple myeloma along with Bence Jones proteins, myeloma globulins, and Ig fragments.

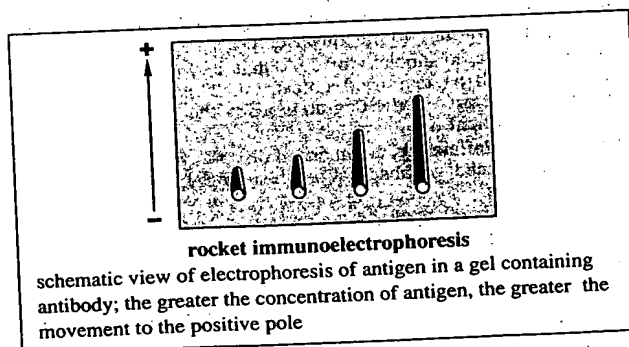
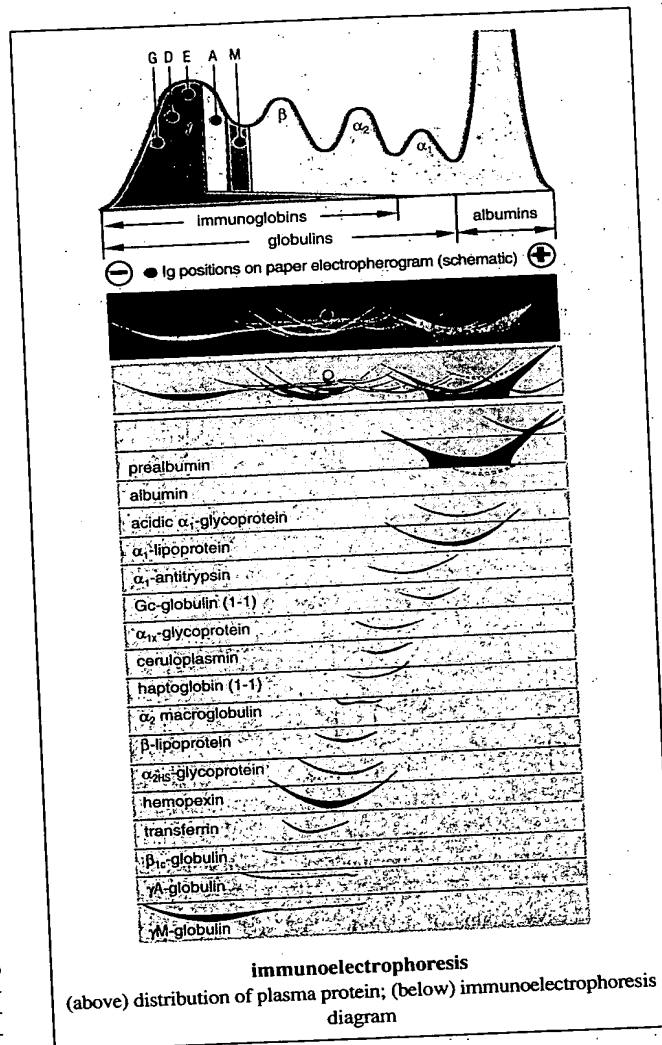
From the amino acid sequences of Bence Jones proteins, it is known that all L chains are divided into a region of variable sequence (V_L) and one of constant sequence (C_L), each comprising about half the length of the L chain. The constant regions of all human L chains of the same type (κ or λ) are identical except for a single amino acid substitution, under genetic controls. H chains are similarly divided, although the V_H region, while similar in length to the V_L region, is only one-third or one-fourth the length of the C_H region. Binding sites are a combination of V_L and V_H protein regions. The large number of possible combinations of L and H chains make up the "libraries" of antibodies of each individual.

anti-D i., *SYN* RH₀(D) immune globulin.

chickenpox i., *SYN* chickenpox immune globulin (human).

i. domains, structural units of i. heavy or light chains that are composed of approximately 110 amino acids. Light chains of an i. are composed of one constant domain and one variable domain. Heavy chains are composed of either three or four constant domains and one variable domain.

i. G subclass deficiency, a rare inherited disorder in which there are reduced levels of one or more IgG subclasses resulting from



defective heavy chain genes or an abnormality in the regulation of i. isotype switching.

human normal i., *SYN* human gamma globulin.

measles i., *SYN* measles immune globulin (human).

monoclonal i., a homogenous i. resulting from the proliferation of a single clone of plasma cells and which, during electrophoresis of serum, appears as a narrow band or "spike"; it is character-